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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/098,730	06/18/1998	TOMIO SUGIYAMA	PM-254782	4440
23117	7590	08/09/2005	EXAMINER	
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			OLSEN, KAJ K	
			ART UNIT	PAPER NUMBER
			1753	
DATE MAILED: 08/09/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/098,730	SUGIYAMA ET AL.	
	Examiner	Art Unit	
	Kaj K. Olsen	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,6,7,10,11,18-22 and 24-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 6, 7, 10, 11, 18-22, 24-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1, 2, 4, 6, 7, 10, 11, 18-22, 26, 29-33, 36-39, 42-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mase et al 4,861,456 in view of Suzuki et al 4,177,112.
3. Claims 1, 2, 4, 6, 7, 10, 11, 18-22, 26 and 29-33, 36-39 and 42-44 remain rejected over Mase and Suzuki for the reasons set forth in the previous office actions. Claims 1, 18, 33 and 39 have been amended to specify that the average size of the sintered particles in the boundary layer is larger than the average size of the sintered particles in the electrolyte layer. It is unclear how this new limitation defines away from Mase in view of Suzuki. In particular, Mase desires a boundary layer 20, 26, 34 or 54 that is porous as *the final product*. See col. 6, ll. 61-65. In addition, the final product of Mase is a sintered device. See col. 7, ll. 19-21. Suzuki teaches that *the final product* of its use of larger particles for the second coating 4' results in a layer that is more porous than the layer 4 made with smaller particles. Hence, one possessing ordinary skill in the art would have recognized that larger sintered particles could have been utilized to arrive at the porous boundary layers of Mase because larger particle material results in a more porous structure (see Suzuki).
4. With respect to new claims 45-48, the relative size of the various particles prior to sintering constitute the process for making the device. The determination of patentability for the claim is based on the product itself. Because the product of the claim is identical to the invention

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of Mase and Suzuki the process from which it was made is the same as or obvious over the process utilized by Mase and Suzuki (see *In re Thorpe*, 777 F.2d 695, 698).

5. Claims 24, 27, 34 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mase et al in view of Suzuki et al and Sugino et al 5,593,558 and Tatumoto et al 5,522,979.

6. These claims further differ by calling for the alumina boundary layer 54 and 34 to be made primarily of alpha-alumina with an average sintering particle diameter of 3-4 microns. Sugino discloses an alumina layer in a solid electrolyte sensor comprising alpha-alumina. See col. 13, line 61. Tatumoto discloses alumina particles with a size of 2.3 microns, which is very close to applicant's 3 microns value. See col. 8, lines 35-40. It would have been obvious for Mase to use alpha-alumina with a particle size of 3 microns for its alumina layers 54 and 34 in view of Sugino and Tatumoto, since the incorporation of known features from analogous prior art functioning as expected is within the skill of the art.

7. Claims 25, 28, 35 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mase et al in view of Suzuki et al and Watanabe et al 4,370,393 or Ikezawa et al 4,421,787.

8. These claims further differ by calling for the electrolyte layer to be made of zirconia partially stabilized by yttria with an average sintering particle diameter of 2-3 microns. Watanabe discloses yttria-stabilized zirconia to be a conventional solid electrolyte material. See col. 4, lines 25-29. Sample 22 in Table 1(c) shows a grain size of 3 microns. Ikezawa also discloses a conventional solid electrolyte of yttria-stabilized zirconia with a particle size of 0.5 to 8 microns. See col. 5, lines 21-41. It would have been obvious for Mase to adopt a yttria-stabilized zirconia electrolyte with a particle size of 3-4 microns in view of Watanabe or Ikezawa

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since the incorporation of known features from analogous prior art functioning as expected is within the skill of the art.

9. Claims 37 and 43 are rejected in the alternative under 35 U.S.C. 103(a) as being unpatentable over Mase in view of Suzuki as applied to claims 33 and 39 above, and further in view of Mase et al (USP 4,559,126) (hereafter "Mase '126"). The primary Mase teaching will continue to be just "Mase".

10. If the combined teaching of Mase and Suzuki are construed as not meeting the limitation concerning the thermal expansion coefficient being "substantially the same", then Mase '126 teaches making the coefficients of expansion for the various sensor layers to be "substantially the same" to prevent the sensor from warping during sintering. See col. 2, lines 54-58; col. 4, lines 62-67; and col. 6, lines 7-15. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Mase '126 for the sensor of Mase and Suzuki to prevent warping of the sensor during sintering.

Response to Arguments

11. Applicant's arguments of May 19, 2005 have been fully considered but they are not persuasive. Applicant urges that if the teaching of Suzuki were applied to Mase, the layer 54 of Mase would be formed by depositing coarse grains of 40 microns to a solid electrolyte body of 10 micron solid electrolyte. First, applicant appears to again *literally* take the particles utilized by Suzuki and apply it to the sensor of Mase (see paragraph 18 of the examiner's previous response to applicant's previous literal use of Suzuki). It is once again unclear why applicant is doing so. The basic premise that Suzuki is being relied on for is the fact that layers desired to be

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more porous can be constructed with larger particles. That doesn't mean that Mase would arrive at his porous boundary layers with the *exact* particles that Suzuki relied on to make the Suzuki layer more porous, but rather that one possessing ordinary skill in the art would recognize that larger particles *relative* to what Mase was using for its other non-porous layers could be utilized to make those boundary layers porous. Moreover, the examiner is confused by the applicant invoking the 10 microns from Suzuki and suggesting that would be utilized for Mase. The examiner has never relied on the teaching of Suzuki for the grain sizes for the electrolyte of Mase. Suzuki is only being relied on to show that larger relative particles produce more porous layers.

12. Applicant continues to urge that the prior art did not recognize that breaking strength is improved when one relies on larger particles. However, it has been well settled that a patent cannot be granted for an applicant's discovery of a result, even though it may have been unexpected good, which would flow logically from the teaching of the prior art.

13. Applicant's arguments concerning the tertiary teachings appear to rely on the applicant's belief in the failings of Mase and Suzuki. Because the examiner did not find those arguments persuasive, these rejections are also being maintained.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Thursday from 5:30 A.M. to 3:00 P.M. and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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August 5, 2005

A handwritten signature in black ink, appearing to read 'Kaj K. Olsen', with a long horizontal flourish extending to the right.

KAJ K. OLSEN
PRIMARY EXAMINER